

Rangeland Suitability Analysis

Powder River Ranger District, Bighorn National Forest
Tensleep Watershed Allotments

Baby Wagon S&G
Dry Tensleep C&H
Garnet Creek S&G
Hazelton S&G

Leigh Creek S&G
McLain Lake S&G
Monument C&H
North Canyon C&H

&
Rock Creek C&H Allotment
In Rock Creek Watershed

South Canyon C&H
Tensleep Canyon C&H
Upper Meadows S&G
Willow S&G

~~012/016/2010~~ 03/24/2010

Introduction:

Rangeland Suitability¹: The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.

Although there is no regulatory requirement to do a Rangeland Suitability analysis at the project level (it is only an LRMP requirement) a project level Rangeland Suitability analysis can provide useful information to the deciding officer.

The number of acres and distribution of Suitable Rangeland on an allotment can be helpful in displaying spatial distribution of forage allocated to various uses. It can be compared to known or proposed livestock use patterns, and indicate management needs; it can be a useful tool in developing management strategies and identifying opportunities. It alone is rarely used to make management recommendations.

It can be used to describe stocking levels. A tabulation of total Rangeland acres Suitable for livestock grazing on an allotment can be useful in comparing the relative stocking levels in AUMs stocked per acre of Suitable Rangeland (AUM/acre). This “stocking rate” can provide the manager an indication of 1) the level of site production necessary to support this number of animals for this time frame, 2) the level of management required to make best use of available forage, 3) the likelihood that full numbers of stock will be supported for the scheduled season, 4) the likelihood that resource problems will occur, such as overgrazing, if full permitted AUMs are grazed. It alone is rarely used to make decisions about stocking or capacities, but it gives an indication.

Rangeland Suitability analysis is not used to decide where livestock may graze. It is not a decision to graze livestock on any specific area of land, nor is it a decision about or estimate of livestock grazing capacity. The Rangeland Suitability determination may or may not provide supporting information for a decision to graze livestock on a specific area. Intermingling of livestock between areas mapped as Suitable will occur on a land base of any significant size. Therefore, Rangeland Suitability determinations are not intended to imply that livestock will be precluded from being found on lands that may not be mapped as Suitable.

Many acres of forested and non-forested lands not mapped as “Suitable” still may provide forage for permitted livestock that may not be reflected in analysis. Transitory rangeland resulting from timber harvest or wildfire is normally not considered Suitable. Incidental use of livestock on lands not mapped as Suitable is normally permissible, but not necessarily planned for. Grazing or moving livestock through areas not mapped as Suitable is not prohibited under law, policy regulation or Forest Plan direction. In addition, the use of these areas is considered incidental and these areas are generally not preferred by livestock due to aspect, slope, lack of forage, etc. Areas not mapped as Suitable are included within allotments because of their intermingled nature and because it is more efficient and cost effective to locate allotment and pasture boundaries on ridgelines and other manageable geographic boundaries rather than attempting to arbitrarily require livestock to only be on specific acres that are determined to be Suitable. This would be extremely difficult if not impossible.

Actual stocking will be based on annual production, a history of meeting annual utilization guidelines, and meeting or moving toward the desired conditions. When guidelines for any year have been met, the livestock must be moved out of the key area, or they will be removed from the pasture or allotment. The permitted number and season of use is subject to change based on evidence of actual use and performance.

¹ 36 CFR 219.3 and FSM 1905

Analysis:

Tensleep and Rock Creek Watersheds:

An assessment of Suitable Rangeland was completed as part of the Big 6 Allotment analysis. It began with a review of the 2005 Forest Plan landscape level Rangeland Suitability analysis map, clipped to the Tensleep Watershed. The Tables below provide the acreage calculated as a result of that modeling exercise, described in the Final EIS for the Bighorn National Forest Land and Resource Management Plan (Forest Plan), November 2005.

Upon close review and in comparison with existing range analysis data (also provided in the tables below) as well as on the ground experience from BNF staff and the ID team, it was clear that the data used in revision of the Forest Plan is of limited value in site-specific application without extensive additional updating. Areas of considerable size that are known to be considered suitable for livestock grazing, as well as some areas known not to be suitable are not accurately displayed. Some large areas known to provide forage are omitted entirely, while in other areas rangeland is included that is not used by livestock. Polygons are inconsistent with actual known areas of forage and types on-the-ground in site-specific areas.

Existing range analysis data, although sometimes relatively old, was determined in many cases to be more reflective of actual conditions, and is considered sufficiently accurate for use in planning.

In some circumstances however, neither the existing range analysis for a given allotment nor the Forest Plan Rangeland Suitability analysis provided sufficient information for making management decisions. Where this was the case (mainly on the S&G allotments) an additional analysis utilizing GIS and a combination of available data including forest vegetation, forest plan suitability analysis, soils, and range analysis maps was completed to create a map and calculate acres of Rangeland Suitable for livestock grazing (Sheep Suitability Map 1-2). Updated range analysis maps were prepared and acres were determined, which may have resulted in some changes in numbers as compared to an older analysis where GIS technologies were not available. In other cases, updated acreage figures reflect changes that have occurred on the ground such as loss of transitory rangeland that was counted in an earlier analysis, or conifer encroachment that has taken over rangeland that was earlier considered suitable. In all cases an ID team provided input to the analysis, and Rangeland Suitability Criteria established for the watershed was applied (Attached G).

The following is a detailed description of the process used for each allotment included in both the Tensleep and Rock Creek watershed wide analysis. Some allotments required a more detailed analysis than others. This is reflected in the tables provided as well as in the corresponding narrative.

Baby Wagon S&G Allotment has been run in conjunction with all or portions of three other allotments in recent years including Crazy Woman, McLain Lake, and Hazelton S&G allotments. Crazy Woman and McLain Lake are both vacant S&G allotments; livestock use has been authorized annually under the Baby Wagon and Hazelton term grazing permits. Although Crazy Woman Allotment is not within the Tensleep watershed and therefore not a part of this analysis, it has been included in this review so that total acres used can be displayed. Access to Crazy Woman may be limited to years when the permittee is able to cross a snowdrift barrier between the two allotments.

The year 2010 Rangeland Suitability analysis considered use of Baby Wagon Allotment by cattle and found it not suitable because it did not meet one or more of the referenced Rangeland Suitability criteria (Attached G).

Allotment	Permitted AUMs	2005 Forest Plan Model		1979 Range Analysis			2010 Analysis (S&G Allotments only)		
		Suitable Acres	Acres/AUM	Allotment Total Acres	Allotment Suitable Acres	Acres/AUM	Total	Suitable	Acres/AUM
Baby Wagon S&G	267	632.30	2.4	3,737	1,498	5.6	3,703	1,394	5.2

Baby Wagon and Crazy Woman Allotments remained combined when 1971 analysis was completed, but have since been split. Forest modeling data is not considered accurate for reasons described in the narrative above. Acres in the 1979 analysis column above were pulled from the 1979 analysis map in the mid-90's in order to separate total acres of Babywagon and Crazy Woman from the combined total provided at time of analysis when allotments were combined.

Allotment	Total acres	Suitable acres	Acres/AUM	Total Acres	Suitable Acres	Acres/AUM
	Available			currently used		
Baby Wagon	3,703	1,394		2,899	1,394	
Crazy Woman	4,024	1,294		150	50	
McLain Lake	7,852	1,807 2163		1,439	762	
Hazelton	4,243	1,978 1,865		4,243	1,865	
Total	19,822	6,473 6829	7.4 7.7	8,731	4,061	4.6

The above data was derived from a combination of both old range analysis maps as well as from a new analysis completed in 2010 by a GIS specialist and a Rangeland Management Specialist comparing the Forest Plan Suitable acres with old range analysis acres. The ID team provided input and Rangeland Suitability Criteria established for the watershed was applied (Attached G). The best available information was combined to create a new analysis map that shows acres available versus acres actually being used.

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Crazy Woman Allotment is not a part of this analysis but rangeland acres are displayed here because of recent annual authorization under the Baby Wagon and Hazelton permits. Table A-2 shows the acres of available rangeland of Crazy Woman Allotment that has been run in conjunction with the Baby Wagon and Hazelton Allotments. A detailed analyses completed in 2010 shows approximately 1,294 acres of Suitable rangeland has been authorized to grazing.

Allotment	Permitted AUMs	2005 Forest Plan Model		1971 Range Analysis				2010 Analysis (Crazy Woman S&G only)		
		Suitable Acres	Acres/AUM	Allotment Total Acres	Allotment Suitable Acres	Acres/AUM	Date Analysis Completed	Total	Suitable	Acres/AUM
Crazy Woman S&G	VACANT	77	N/A	5,466	3,495	N/A	03/05/1971	4,024	1,294	N/A
Crazy Woman Allotment has been vacant since it was split off from the Baby Wagon Allotment in 1992. Acres shown in the 1971 analysis include areas not suitable or available for use by sheep, since lower elevation portions of the Crazy Woman Allotment were allocated to cattle from the adjacent Muddy Creek C&H Allotment as part of a 1998 decision. Refer to table A-15 for more information on how Crazy Woman has been annually authorized under the Baby Wagon and Hazelton permits in recent years. Forest modeling data in this table is not considered accurate for reasons described in the narrative above.										

There are no foreseeable allotment boundary changes or allotment consolidations proposed for the Dry Tensleep Allotment. Data from a 1986 range analysis data is reflective of actual conditions, and is considered sufficient for use in planning.

~~Suitable~~ rangeland Suitable for grazing by cattle or sheep, on the remainder of the allotment.

[illegible]

Recent analysis of Garnet Creek Allotment shows the allotment currently contains 4,347 acres, 1,883 of which were determined to be Suitable for grazing by sheep. The updated analysis indicates considerably fewer acres are Suitable compared to the 1984 analysis. A large portion of forested lands on the allotment was burned in the mid 1980's and was counted as Suitable in the 1984 analysis. Because of regeneration, it is no longer considered Suitable.

the allotment however would remain the same.

The year 2010 Rangeland Suitability analysis considered use of Garnet Creek ~~Wagon~~-Allotment by cattle and found it not suitable because it did not meet one or more of the referenced Rangeland Suitability criteria (Attached G).

Allotment	Permitted AUMs	2005 Forest Plan Model		1984 Range Analysis			2010 Analysis (S&G Allotments only)			Proposed Allotment Boundary Change	
		Suitable Acres	Acres/ AUM	Total Acres	Suitable Acres	Acres/ AUM	Total	Suitable	Acres/ AUM	Current Acreage	Proposed Acreage
Garnet Creek S&G	826	333	0.4	5,157	2,965	3.6	4,347	1,883	2.3	4,347	4,624

Beginning around 1992 sheep from the Hazelton Allotment were permitted in one band together with those from Baby Wagon Allotment, with annual authorization of Crazy Woman and McLain Lake Allotments. Before that time Hazelton Allotment had been managed separately. Table A-5 displays several Suitability analysis results from over the years. Similar to the findings of the 1981 analysis, a recent range analysis concluded that there are approximately 1,865 acres of Rangeland Suitable for sheep on the Hazelton Allotment.

Table A-5

Leigh Creek S&G:

Currently, there are approximately 2,741 acres on Leigh Creek Allotment, 925 of which are considered Suitable Rangeland for sheep. A proposed allotment boundary change would remove 277 acres located north of Highway 16 from the Leigh Creek Allotment and transfer it to the Garnet Creek Allotment. No Suitable Rangeland would be lost in the transfer although the Garnet Creek Allotment would gain some transitory range.

The year 2010 Rangeland Suitability analysis considered use of Hazelton Allotment by cattle and validated a 1995 analysis that found it not suitable because it did not meet one or more of the referenced Rangeland Suitability criteria (Attached G).

Table A-6

Allotment	Permitted AUMs	2005 Forest Plan Model		1983 Range Analysis			2010 Analysis (S&G Allotments only)			Proposed Allotment Boundary Change	
		Suitable Acres	Acres/ AUM	Total Acres	Suitable Acreage	Acres/ AUM	Total	Suitable	Acres/ AUM	Current Acreage	Proposed Acreage
Leigh Creek S&G	VACANT	268	N/A	2,690	645	N/A	2,741	925	N/A	2,741	2,463

Portions of the Leigh Creek Allotment North of the Highway 16 corridor are not being used due to inaccessibility. The permittee feels that the minimal feed available north of the Highway does not justify the expense. This portion of the Leigh Creek Allotment is adjacent to and would work well in conjunction with the Timber Unit of Garnet Creek Allotment. A small amount of transitory range exists North of the Highway but there is very little Suitable to grazing by sheep. The removal of north Leigh Creek Pasture would subtract approximately 277 acres from Leigh Creek Allotment.

Recent analysis of the Tensleep Watershed Sheep and Goat allotments found the McLain Lake Allotment ~~currently~~ had 7,852 total acres, 2,163 of which were determined to be Suitable for use by sheep. ~~However, some of the higher elevations of McLain Lake Allotment have not been grazed in many years. One proposed action is to eliminate portions of McLain Lake Allotment that are not being utilized by sheep and probably never could be due to elevation, low forage, topography, etc. In reviewing the most recent (2010) analysis of McLain Lake Allotment this action would remove approximately 2,120 acres, none of which is considered to be Suitable for grazing by sheep or cattle. Table A-7 displays how the shift in the allotment boundary would change the total allotment acreage.~~ Table A-15 shows how McLain Lake Allotment has been used since it became vacant in 1990 and how the Acres/AUM utilized on the allotment have increased.

Table A-7

Monument C&H:

Table A-8

North Canyon C&H:

Table A-9

Allotment	Permitted AUMs	2005 Forest Plan Model		1987Range Analysis			2010 Updated Analysis	
		Suitable Acres	Acres/ AUM	Allotment Total Acres	Allotment Suitable Acres	Acres/AUM	Allotment Total Acres	Allotment Suitable Acres
North Canyon C&H	3,715	4,564	1.2	13,384	6,644	1.8	12,080	6694

Fence 504211 (Tensleep Creek Drift Fence) in the lower portion of Tensleep Canyon is off of North Canyon Allotment, it is the maintenance responsibility of the North Canyon Permittee, and it prevents drift of their cattle further down-canyon in the fall. There are an additional 254 *total* acres and 125 *Suitable* acres between this fence and the current allotment boundary, not reflected in the [2010 updated columns](#) above [table](#). Supplemental document and map 1.1 shows the correct representation of the allotment boundary around Meadowlark Lake as well as [the 254 total acres and 125 Suitable](#)-acres in the canyon that are [currently](#) off the allotment. [Should these changes be made, the revised acreages would be 12,334 total and 6,819 Suitable, with Suitable Acres per AUM at 2.0.](#)

The existing range analysis completed in 1984 was considered sufficiently accurate for use in planning. As shown in table A-10 the 1984 analysis found 1,278 acres of a total 30,720 acres in the Rock Creek Allotment Suitable to cattle and sheep grazing livestock grazing. A proposed allotment boundary change would add 37 total acres to Rock Creek Allotment; there would be no effect however to acre of S suitable rangeland. ~~AA-~~ very large area of the Rock Creek Allotment is heavily timbered rendering it not Suitable to livestock grazing.

Allotment	Permitted AUMs	2005 Forest Plan Model		1984 Range Analysis <i>(updated 12/2010)</i>		
		Suitable Acres	Acres/ AUM	Allotment Total Acres	Allotment Suitable Acres	Acres/AUM
Rock Creek C&H	1,146	1,292	1.1	30,720	1,278	1.12
<p>Allotment total acres: will increase when because a proposal to relocate portions of the Rock Creek Allotment boundary fence are constructed that would remove 37 acres from the adjacent Clear Creek Allotment and add it to the Rock Creek Allotment</p>						

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The existing range analysis completed in 1976 was found to be a sufficiently accurate for use in planning. As shown in table A-11 the 1976 analysis found 6,459 acres of the South Canyon Allotment Suitable to cattle and sheep grazing ~~livestock~~ grazing.

Allotment	Permitted AUMs	2005 Forest Plan Model		1976 Range Analysis		
		Suitable Acres	Acres/AUM	Allotment Total	Allotment Suitable Acres	Acres/AUM
South Canyon C&H	1,877	2,488	1.3	13,532	6,459	3.2

Much of the data from 1967 range analysis was found to be a sufficiently accurate for use in planning. However, some versions of allotment maps indicate corrections need to be made, and areas of livestock use have both been adjusted and proposed. Supplemental document and map 1.1 shows the locations of the various areas as described in the table below.

Allotment	Permitted AUMs	2005 Forest Plan Model		1967Range Analysis			*2010 Updated Analysis		
		Suitable Acres	Acres/ AUM	Allotment Total Acres	Allotment Suitable Acres	Acres/AUM	Allotment Total Acres	Allotment Suitable Acre	Acres/AUM
Tensleep Canyon C&H	699	1,779	2.5	2,671	1,470	2.1	2913	1323	1.9
<p>C = 45 acres total; 45 Suitable acres - In canyon, below highway, currently used, not part of the allotment, shown on some maps as part of the allotment.</p> <p>D = 25 acres total; 25 Suitable acres - In canyon, below highway, currently used, not part of the allotment, not shown on maps as part of the allotment.</p> <p>E = 116 acres total; 116 Suitable acres - In canyon, above highway, not currently used but proposed for use, part of allotment</p> <p>B = 56 acres total; 56 Suitable acres - In canyon, above highway, not currently used but proposed for use, not part of allotment but shown on some maps as part of the allotment</p> <p>A = 446 acres total; 246 Suitable acres - On canyon rim, not part of allotment but proposed to be part of allotment; may have been used in some years.</p> <p>*Current 2010 authorized use includes the allotment plus areas C and D, not E and B of Supplemental document and map 1.1</p>									

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Upper Meadows S&G:

Recent analysis of the Tensleep Watershed Sheep and Goat allotments found the Upper Meadows Allotment ~~currently~~ had 4,101 total acres, 1,763 of which were determined to be suitable. ~~However, some of the higher elevations of in the northern portions of the allotment have not been grazed in many years. Elimination of excess portions of Upper Meadows Allotment that are not being utilized by sheep has been proposed. In reviewing the most recent (2010) analysis of Upper Meadows Allotment this action would remove approximately 231 acres, none of which is considered to be Suitable for grazing by sheep. Table A-13 displays how the shift in the allotment boundary would change the total allotment acreage.~~ Table A-16 shows how Upper Meadows Allotment has been used since adjacent allotments became vacant, and how the Acres/AUM utilized on the allotment have varied from permitted.

The year 2010 Rangeland Suitability analysis considered use of Upper Meadows Allotment by cattle and found it not suitable because it did not meet one or more of the referenced Suitability criteria.

Table A-13

Allotment	Permitted AUMs	2005 Forest Plan Model		1986 Range Analysis			2010 Analysis (S&G Allotments only)			Proposed Allotment Boundary Change	
		Suitable Acres	Acres/AUM	Total Acres	Current Acreage	Acres/AUM	Total	Suitable	Acres/AUM	Current Acreage	Proposed Acreage
Upper Meadows S&G	639	825	1.3	6,996	2,159	3.4	4,101	1,763	2,759	4,101	3,870
Upper Meadows Allotment has recently been run in conjunction with annual authorization on Willow and Leigh Creek Allotments. Refer to table A-16 for more information on how Upper Meadows, Willow and Leigh Creek Allotments have been managed.											

Table A-16 Combined Upper Meadows Suitable rangeland as actually used in current management, and potentially used vacant allotment acres.

Allotment	Total acres	Suitable acres	Acres/AUM	Total Acres	Suitable Acres	Acres/AUM
	available			currently used		
Upper Meadows	4,101	1,763		3,870	1,763	
Leigh Creek	2,741	925		2,463	905	
Willow	11,160	2,321		4,606	2,177	
Total	18,002	5,009	7.8	10,939	4,845	7.6
The above data was derived from a combination of both old range analysis maps as well as from a new analysis completed in 2010 by a GIS specialist and a Rangeland Management Specialist comparing the Forest Plan Suitable acres with old range analysis acres. The ID team provided input and Rangeland Suitability Criteria established for the watershed was applied (Attached G). The best available information was combined to create a new analysis map that shows acres available versus acres actually being used.						

Willow S&G:

Recent analysis of the Tensleep Watershed Sheep and Goat allotments found the Willow Allotment currently had 11,160 total acres, 2,321 of which were determined to be suitable. ~~However, some of the higher elevations in the northeastern portions of the allotment have not been grazed in many years. Elimination of excess portions of Willow Allotment that are not being utilized by sheep has been proposed. This action would remove approximately 2,010 acres, none of which is considered to be Suitable to grazing by sheep. Table A-14 displays how the shift in the allotment boundary would change the total allotment acreage.~~ Table A-16 shows how Willow Allotment has been used since it became vacant and how the Acres/AUM utilized on the allotment have varied.

The year 2010 Rangeland Suitability analysis considered use of Willow Allotment by cattle and found it not suitable because it did not meet one or more of the referenced Suitability criteria.

Table A-14

Allotment	Permitted AUMs	2005 Forest Plan Model		1981 Range Analysis			2010 Analysis (S&G Allotments only)			Proposed Allotment Boundary Change	
		Suitable Acres	Acres/AUM	Total Acres	Current Acres	Acres/AUM	Total	Suitable	Acres/AUM	Current Acreage	Proposed Acreage
Willow S&G	VACANT	970	N/A	11,421	2,217	N/A	11,160	2,321	N/A	11,160	9,150
Willow Allotment has recently been run in conjunction with Upper Meadows and Leigh Creek Allotments through annual authorization under the Upper Meadows permit. Refer to table A-16 for more information on how Upper Meadows, Willow and Leigh Creek Allotments have been managed.											

References:

- 1995 Suitability Analysis for Leigh Creek S&G
- Bighorn National Forest Land and Resource Management Plan (Forest Plan), November 2005, Final EIS